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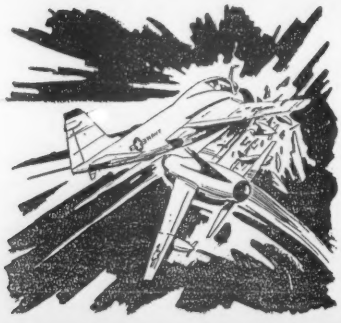
This issue of Approach is dedicated to our foremost illustrator, Blake Rader, who is retiring after 25 years of dedicated service. When Blake came to the Safety Center, he didn't know a Phantom from a Skyraider. By the time he decided to hang up his brushes, he had illustrated every aircraft flown by the Navy and Marine Corps during the last three decades.

Blake developed a special talent as an illustrator. If you've looked at Approach for any length of time, you've probably been enticed into reading more than one article because of this talent. Blake produced more than 100 covers and well over a thousand line art and article illustrations. He attacked each assignment with his characteristic passion for detail and accuracy.

The enduring success of Approach as a leader in aviation safety is directly related to Blake's artwork. By the time you read this, Blake will have already cleared off his drawing table and packed up his pencils and brushes. Although this is the last issue Blake worked on, he has left a cabinet full of artwork. This certainly won't be the last Approach to feature his work.

LCdr. Dave Parsons
Editor



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Cover painting by R.G. Smith of all Blue Angel aircraft types over a 40-year span.

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Safety and the

"The bottom line is you can be good, but if we don't trust you, we aren't going to get near you. You've got to have confidence in each other."

Approach Talks to The Blue Angels

By Peter Mersky

THE Blue Angels — officially the U.S. Navy Flight Demonstration Squadron — recently observed their 40th anniversary. Since their formation in 1946 with Grumman F6F Hellcats, the Blues have flown seven different aircraft. Nearly 200 million people have watched the Blue Angels worldwide, and they have been the most constantly visible example of U.S. naval aviation from the general public's viewpoint.

Their compatriots in the fleet view the Blues from several aspects, some favorable, others less rosy. As any squadron, the team struggles to maintain a good safety record, while still running its hectic pace of 75 shows annually. The Blues have seen good and bad times. At one point in 1973, they faced disbanding after a series of fatal mishaps.

As the 1986 season ends, the team is preparing to transition to its eighth regular aircraft, the McDonnell Douglas F/A-18 Hornet. This will be the third McDonnell Douglas product used by the Blues. The first five aircraft were all Grumman products.

Approach visited the team while they were at NAS Oceana in September, getting ready to give one of their last shows in the A-4 Skyhawk, which they have flown since 1973. Lt. Pat Walsh, a second-year pilot, who flies the No. 4 (slot) position talked about the team's overall makeup, their views on safety, and how the Blues see themselves as individuals and team players — always an important aspect of naval aviation.

Lt. Walsh joined the Blue Angels in October 1984. He flew in the 1985 season and is now the team's Hornet transition coordinator. The normal tour with the team is two years, but Lt. Walsh, along with other current members, will stay another year to facilitate the F/A-18 transition.

Approach: How do the Blues conduct training after a mishap? Are there any special back-in-the-saddle procedures?

Lt. Walsh: I've only seen one mishap since I've been with the team. We fly approximately 500 hours a year, mostly less than one-hour flights, so we're looking at a lot of sorties. If you sit for more than two days without flying, you really feel it, particularly in my case as the slot pilot. A lot of the safety

The Blue Angels' first mount was the Grumman F6F Hellcat.

Blues

The last Grumman aircraft used by the team was the F11F-1 Tiger, which served from 1957 to 1968.

The A-4 joined the Blue Angels in December 1973.

procedures I use in flight are based on perspective, on feeling how things are going. I may be answering your question in an indirect way, but what I'm getting at is the farther you get from flying, the farther you get from trusting your own feelings. I have to back myself up with more than airspeed and altitude, pitot-static instruments, which actually lag quite a bit. I can judge a roll rate or a loop just by how things feel. But if I'm down for more than two days, I tend to lose that.

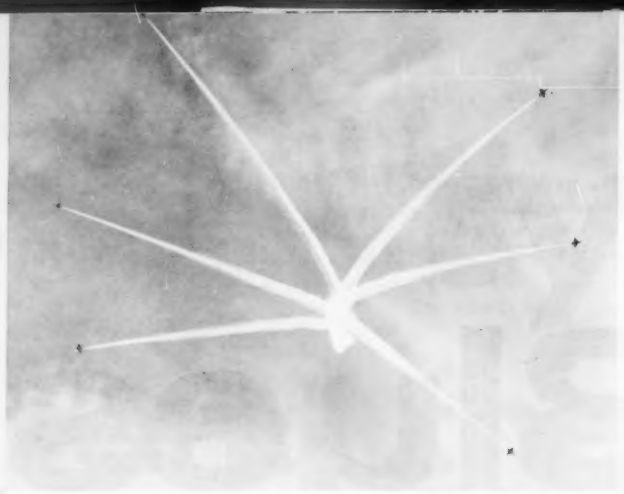
Following last year's accident, a midair where we lost two aircraft and one pilot, we spent a lot of time with each other, talking about how we all felt. We went over the accident for hours and hours. We decided the best thing we could do was to fly. Not only to honor the pilot's memory, but for the very simple reason that if we sat too long, we would have done a lot of damage to our program. We didn't stand down for a day, but we spent a lot of time talking about the accident and what we learned from it.

A lot of what we do can be compared to flying around the ship, the intensity, the pressure. Those are the types of skills that are constantly being put to the test in the cockpit. When you're around the ship and there's been an accident, you continue to fly. It's probably the most demanding type of flying you will do, especially under that kind of emotional duress. But it also says a lot for your abilities to continue to concentrate and fly with that type of adversity. The strength of the squadron, as any other squadron, comes from within.

Approach: Obviously, the Blues have a safety program, but what are the special considerations?

Lt. Walsh: The safety program is pretty interesting. First, there's a safety school graduate who acts as the overall safety officer. In this particular case, he's a Marine C-130 pilot. The other aspect is we have a safety officer designated in the formation that briefs and debriefs safety. In addition, we've got people on the ground, like our maintenance officer and our flight surgeon, who act like LSOs. They describe what they see from the ground. They keep track of whether maneuvers are low or whether we're too close to the crowd.

McDonnell Douglas F-4J Phantoms served from 1969-73.



As the slot pilot, I am also the safety pilot in the flight because I back up the Boss. There's a number of considerations that run through my mind when I fly, not only the Boss' profiles, but the distances between wingtips, positions 2 and 3, the fuel, runway condition, weather and the nearest divert.

Approach: Are there different requirements for flights due to the closeness of the maneuvers and the environment of the air show?

Lt. Walsh: It's a really dynamic environment. And because it is, no two days are ever going to be the same. The conditions may warrant that we bring the "set" down, which means the airplanes will be a little bit further apart, so we have enough flexibility in the program to accommodate just about any kind of condition, weather or mechanical.

There's a piece of sky that has our name on it — it's called "clear air space." It's a place where we can always go whenever we feel uncomfortable with weather, our plane or we just don't like what we're seeing. That allows us flexibility, especially when we're learning maneuvers.

Our training is a disciplined, step-by-step approach, starting with two airplanes at a high altitude. We start stepping the altitudes down, bringing more planes into the formation and finally bringing the formation closer together as time goes on. It's about 150-170 training flights before we're ready to perform our first show. We train at El Centro from January to March, or in the case of the F/A-18, April 1987. That allows a lot of repetition, and that allows us to gain confidence in each other. You'll hear a lot of laudatory comments about professionalism, how well the team operates, and that's fine. But the bottom line is you can be good, but if we don't trust you, we aren't going to get near you. You've got to have confidence in each other to fly as close as we do to each other.

Approach: How does the team address compatibility and personalities?

Lt. Walsh: I mentioned earlier the requirements to fly for the team. You have to have been around the ship environment; and when a person can operate around the ship, day and night, blue water ops, that speaks for his abilities, and that's the baseline we're looking for in applications. Then it really comes down to being able to work with people. We're also looking for people who can handle being on the road 300 days out of the year.

For example, when we're in winter training, we'll be briefing at 0600 or 0630; we'll fly that morning and that afternoon. The debriefings can be fairly curt, fairly abrupt at times. There are absolutes we have to deal with because of the safety aspects of the job. No matter what his seniority, a person has to accept criticism, learn from it and not make the same mistakes again.

If you go into this job with anything less than 150 percent, you're going to let somebody down, either your teammates or the people you represent.

Naval aviation is a very small community. Everybody's reputation is fairly well-known. I was concerned with my reputation when I applied, but word gets out by the grapevine — how you've done, what you've got going for you. I hadn't worked with any of the guys on the team, although I knew some of them because they came from the Lemoore community. I applied for the team in February, went to four air shows,

one a month, and was selected. It's not so much a popularity contest, as you're looking to meet people that you've never worked with before, and see if you want that type of job. That's the attitude I took. When I applied, the people on the team seemed to be a lot of fun to work with.

What we do now is to make a list of finalists during the summer and invite them to Pensacola to stay for a week. They get a chance to attend a few social engagements, meet the families and see how they like it.

Approach: Are there procedures for extremis situations, dispersing the flight or voice commands? Continued

Cdr. Gil Rud, leader of the Blue Angels

Flight Briefing, Blue Angel Style

While the Blue Angels are the most public of Navy squadrons, they closely guard their behind-the-scenes activities. Very few people are allowed to attend a brief, for it is the one time when the pilots can talk business without distractions. Thus, it was a rare privilege and welcome opportunity when Approach was invited to sit in on a preflight brief.

At first, only one thing separated this briefing from any other: the blue flight suits worn by the pilots around the very ordinary table. The usual light-hearted ready room banter ceased when the Boss, Cdr. Gil Rud, leader of the Blues, entered. While he attended to a few matters with LCdr. Jim Anderson, the maintenance officer, the others shuffled their notes. A round-table discussion, typical of most squadron AOMs, ensued with the pilots noting items of interest: power lines, bird strikes (a prime concern for the team) and various other points. Then the atmosphere underwent a change.

Cdr. Rud held an 8-by-10 overhead photo of NAS Oceana, as did all the pilots, and after a rapid-fire delivery of current weather and wind conditions, he launched into what can only be described as "the Blue routine." As he turned the photo, he ran through the entire flight sequence, from man-up to shutdown, with all the maneuvers and commands in between. It was a singsong delivery until I realized he was doing the routine exactly as he would from the cockpit, using the same voice inflections, the same length of time for maneuvers, so that his pilots would know how things should sound when the show was going right. Thus, they would know when something went wrong.

We're parked for a reverse walkdown, around the jets, crank' em up on Bravo 8 and 9 . . . reverse taxi out, checks on the parallel, on the runway, diamond takeoff, high-performance climb, left turn-out . . . Griz' (LCdr. Curt Watson, lead-solo, plane No. 5) dirty roll, Hollywood's (Lt. David Anderson, opposing solo, plane No. 6) clean roll, half Cuban 8 . . . Solos are in with the knife edge. Diamond's in from the right, Diamond 360 . . . Solos are in with the inverted . . . Diamond's in from the left with a change-over roll, and Hollywood's in from the left with a sneak pass . . . .

A lit-tt-le more pull. Coming left. We're in a left turn . . . Eaa-sing the pull, roll-lling out some bank. Line abreast . . . Wings arr-rre level . . . Smoke onnn-n. Up wee-ee go. A litt-tle more pull-l. Adding power, eaa-ssing the pull. Eee-eesing power . . . Commmm-mes the pull . . . Go Diamond Stinger. Grizzz-zz detach . . . Griz is clear . . . Mark two miles, eight seconds. Smoke onn-nn. Standby the boards . . . Booo-oards! Rolll-ling out. Standby the gear. Gearrr-r. Standby the flaps. Flaps. Adding power. Boss has gear, flaps . . . Coming right.

. . . At the 90, gear check. Check your spoilers armed. Rollllling out . . . ee-easy brakes . . . go left echelon. Check headknockers down. Smoke switches off-ff . . . Canopies unlocked . . . canopies open. Shut down . . . helmets . . . dismount.

There is a combination of choreographer, flight instructor and commanding officer in Cdr. Rud.

Lt. Walsh: The Boss looks at some hard numbers when he's doing maneuvers. I back him up in the Slot position. Three hundred knots in one place is not going to feel the same as 300 knots somewhere else. He's got to have a "gut" feeling as to how things are going, and that's what my job is, to back him up as far as those numbers go — altimeter, airspeed, but more than that. For instance, I've got a deep feeling that this roll rate isn't right. It hasn't surfaced yet as far as the numbers I'm seeing, altitude or airspeed, but it feels like it's starting to slow down; and the nose is starting to bury. I'll tell the Boss to speed the roll. We have an LSO platform type of relationship. He'll honor the call, and we'll talk about it later.

The extremis calls you can hear are like when the wingtips get real close. I'll give them an "Easy" call, which means they're starting to work just a little too close to each other. If there's complete overlap, I'll tell them to "Spread 'em," which means to go right for the right wingman and left for the left wingman. If we find ourselves in an extremis situation, say for an overhead, I'll tell them to recover on their own.

Some maneuvers are easier to back up than others, such as the Diamond. I feel comfortable when I'm back there, but in line-abreast, it's a lot more difficult. My instruments are, of course, inside; and when I come inside the cockpit to look, it results in my moving in and out of the airplane. I don't like to do that a lot since I'm doing a lot of stuff off the horizon. The HUD presentation in the F/A-18 will alleviate much of this problem.

In a Delta-landing situation, where we put 18 wheels down on the runway all at the same time, we can blow a tire. Then we use the chutes. On a 5,000-foot runway, as a normal operation we use the chutes. Our formation landings have strict guidelines so far as crosswind, runway length and width are concerned. It's cut and dried. If we can meet those criteria, we'll do a formation landing.

Approach: How do the Blues balance their frantic pace, travelling and social activities, against fatigue and possible degradation of flight skills?

Lt. Walsh: We had a mishap in 1973, when two F-4s collided on the way to a site. We lost two pilots, including the Boss at that time, and an enlisted ground crewman. Investigation showed that the team had been inundated with a lot of jobs and a frantic pace. The guys were flying those 500 hours a year, which means your whole day is absorbed with flying. In combination with other administrative duties, it just got to be too much.

1973 was the nadir for the team. In March, during winter training, three F-4s collided in flight, although the three pilots ejected safely. A hectic pace of worldwide shows — England, Turkey, Italy, Iran, Spain and France, the Bahamas — as well as another ejection in early July, set the stage for the July 26 mishap described above, which took the life of LCdr. Skip Umstead. He had served with the team in 1970 and was recalled to take over for LCdr. Don Bently, who had sustained injuries during his ejection in the March collision. As a result of the July 26 midair, the remainder of the 73 season was cancelled, and the F-4s retired after five seasons. Disbanding the Blue Angels was also under heavy consideration, but after much discussion at high levels, the decision was made to retain the team as a valuable recruiting asset. — Ed.

"It's real simple. You've got to be honest with yourself. When you've reached your limit, you've got to let somebody know."

PH3 Thomas Rodreguez

First F/A-18A Hornet for the Blue Angels taxis into Pensacola in November 1986.

Now, we have admin and maintenance support officers on the team. The pilots take care of operations and safety, but delegate other areas of responsibility. We still are tasked with some duties other than flying, as in a regular squadron, but we protect the first-year guys so that all they have to worry about is flying. We don't have an XO. The Admin Officer acts as the XO. The Boss can get hit with all kinds of CO stuff. NATOPS and flight planning is now a full-time job because we spend all

our time on the road.

Approach: But there are no designated parameters to fly or not fly?

Lt. Walsh. It's real simple. You've got to be honest with yourself. When you've reached your limit, you've got to let somebody know. I got sick in Seattle, and I needed to take a break. I did. The team flew with five airplanes. We're not going to do that very often; it's only happened once this year. We answer to ourselves. As I said earlier, the strength of the squadron comes from within.

Approach: During Transpo '72 in Washington, the Blues and Thunderbirds flew together; each team was flying Phantoms at the time, the only period when the two groups flew the same aircraft. At the recent Liberty celebration in July 1986, the two teams appeared simultaneously. Is there much competition, however friendly, between the two teams? Do you exchange information or experiences?

Lt. Walsh: Sure, you bet, but it's more like pride in ownership. We want to make the Navy look good; they want to make the Air Force look good. We try to get together with the Thunderbirds at least once a year. We met at Nellis last year and flew an air show. Likewise, they'll come to Pensacola this year to fly. We had a chance to meet them for the Statue of Liberty festivities; however, it was only a simple rendezvous.

Approach: I understand the T-Birds are considered a bit more conservative than the Blues.

Lt. Walsh: Well, they probably have more direction, consistant with Air Force policy, as to what their pilots do.

Approach: How is the Hornet being introduced — through a normal FRS syllabus or a special training course?

Lt. Walsh: The enlisted personnel are going through FRAMP training right now at VFA 106 at NAS Cecil Field. By the end of our 1986 season, nearly all enlisted training will be complete. The pilots went through the FRS November 17 until Christmas, taking a Cat 4 syllabus — basically a NATOPS qualification in the airplane — specially designed for us. We tried to get as much of the fundamentals of flying the F/A-18, along with some of the air-to-air and air-to-ground subspecialities.

The scheduling is tight. Usually, we get two weeks off a year. This year, we've frozen the team; normally, I would expect to leave in November along with two other pilots, and we would have a 50 percent turnover of the team during the year. This year we will fly two weeks and get one day off until the end of March when we start the season. We won't swap pilots until the end of the '87 season. It's a pretty hectic schedule.

Since I used to fly the F/A-18 in VX 5, I've recently requalified. And we're getting lectures now, every weekend with a different subject, so that when we show up at VFA 106, we'll have a little better understanding of what to expect from the airplane.

Right now, we don't know the date of the first Hornet show, nor the place. The schedule is written in the October-November time frame. There are a few considerations. In the A-4, we flew at fields with only 5,000-foot runways, but we don't really know what we'll do with the F/A-18 the first year or two. By the second year, we'll have more experience. When a fleet squadron stands down to transition, it's allowed a year to become operational again. In our case, not only do we start training pilots in December, but we will put on a show in April.

With the A-4, the fleet had a lot of experience with the airplane before the Blue Angels got it, i.e., cruises, combat missions. The F/A-18 has only two cruises. We have received great support from the Naval Air Systems Command to evaluate the Hornet and its different regimes, such as inverted flight. Fortunately, they're nearly finished with their testing.

Approach: How are the Hornets being modified to fly with the Blue Angels?

Lt. Walsh: The airplanes we're going to be flying are Lot 4 airplanes being upgraded to Lot 6 airplances with 8.3.3 PROMS. There are some hardware and software changes. And we'll get two "Ts" that will not be modified.

The digital flight control system of the Hornet will be modified to include artificial "feel," a stick force of moderate weight around 8 to 15 pounds. In the past, we have induced this "feel" with full trim or elevator repositioning. Full nose-down trim is not the best way to fly the F/A-18. It changes the flight characteristics of the aircraft. In the A-4, the stab is one degree and elevator full nose down — you can see it when we taxi — and the stick is all the way forward into the instrument panel. We are able to fly close formations with 36 inches of wingtip separation in any kind of atmospheric condition, as

This F/A-18 Hornet is engaged in flight testing. Belonging to the Strike Aircraft Test Directorate at the Naval Air Test Center, the F/A-18 is shown evaluating the aircraft fuel system during extended inverted flight as performed by the Blues.

well as in inverted flight.

The Hornet has to be modified for inverted flight. It has a tremendous pitch rate, so you'll probably see the airplanes closer to the ground than the A-4. In the A-4, we go over the top of an overhead maneuver at 7,000 or 8,000 feet. We shouldn't have to go that high in an F/A-18. The A-4's slats are wired shut to prevent instability when you go over the top in formation. And while the Hornet's thrust-to-weight ratio is not exactly 1:1, as in the A-4, it's close enough. We'll take off with a weight of between 33,000 to 34,000 pounds.

A check with the project officer for the Blues' Hornet transition at Patuxent, elaborated on the way the Hornet is being modified.

"We tried to give the Blue Angels artificial feel in the stick by using the addition of four springs which give approximately 10 pounds of stick force at the neutral stick position. Specific Blue Angels software will also be loaded that give additional HUD cues and enable VOR/ILS capability."

"Regarding inverted flight, the Blues' will have upgraded Lot 6 aircraft with new fuel systems and flight controls. The aircraft will also have a warning light that denotes a fuel pressure drop, giving a five-second warning between the drop to engine flameout. This sensor will be important during inverted flight."

"We have investigated the airplane throughout the entire Blue Angel envelope, all the maneuvers requiring negative g, inverted flight . . . And Naval Air Systems Command is reaching the clearance point." — Ed.

Approach: Will the handling characteristics of the Hornet, especially near the ground, necessitate changes or considerations, especially in formations?

Lt. Walsh: The ground environment will be different than in the A-4. Because of the Hornet's low intakes, problems with FOD and formation taxiing and landing are areas we'll have to take a close look at. We can't operate the airplane like we did the A-4. We'll have to wait till next year to see how our flight profiles change.

Approach: Will the Hornet's engine response require different techniques?

Lt. Walsh: The corrections that apply to each wingman in maneuvers will be the same. They're left-handed corrections. When we first have pilots fly with us, we teach them to minimize the right-handed or wing-type corrections you make in a formation and to constantly make power and rudder changes. That allows you to fly close together and not affect someone else. So whether in the A-4 or F/A-18, that technique remains the same.

One thing which we do notice, is that as the F/A-18 slows down, the leading and trailing edge flaps begin to program down when it gets below a certain airspeed. We have to overcome that increased drag with more power. Of course, that's what makes the F/A-18 magic: Everything programs down, giving such a small turn radius.

Approach: Will the "g" performance of the F/A-18 require g-suits, which you didn't have to wear in the A-4?

Lt. Walsh: First of all, the Hornet has such a fast pitch rate that you experience g onset incredibly faster than in an A-4. We will be experiencing the same problems as the fleet; g-suits are generally less effective for high rate of onset (+G) due to valve limitations. Fortunately, diamond maneuvers do not necessitate these high rate of onset G loads. We have been talking to NAMRL (Naval Aerospace Medical Research Laboratory) and researching the literature concerning recent work being conducted on g tolerance in the F/A-18. This research, conducted in cooperation with VFA 125 at Lemoore, assesses the importance of weight training, early use of AGSM (anti-G straining maneuvers) and centrifuge training in the fleet. During winter training the show profiles will be carefully assessed in light of the NAMRL conclusions.

What's more important to us is that once you're strapped into the seat, you don't move. Right now, we have a lap belt which goes across, then a couple of thigh restraints, two vertical restraints, as well as a torso restraint.

Approach: What maneuvers are being considered for the Hornet?

Lt. Walsh: Well, it'll take us a little time to get to know the airplane. I've flown all the diamond maneuvers, and it handles those just fine. It'll open a lot more doors for the solo program because the airplane can do so much more.

In closing, I think this is probably the most rewarding job I've ever had. This is a rare opportunity, and it's kind of hard to describe. Anything worth doing, you have to put a lot of work into. Likewise, anything worth doing provides you with a lot of satisfaction. You don't need people to tell you how well you've done. You know when you've done well.

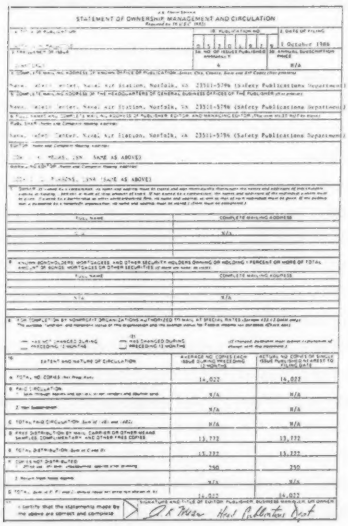
The author would like to acknowledge the assistance of: Lt. Doug Hocking, Blue Angels Public Affairs Officer; PHAN Mike Skeenes, team photographer; and the Naval Air Test Center's Major Rick Shows and Capt. Gene Fraser; Bruce Kaplan, lead engineer for flying qualities; Mark Swierczek, lead engineer for fuel system engine compatibility; and the Naval Air Test Center's Public Affairs Office.

Peter Mersky is a staff writer for Approach. He has written three books and numerous articles on U.S. Navy and Marine aviation.

I'd Rather Be Lucky Than Good

By Ltjg. W.J. Davis, Jr.

. . . I am sure that if I did eject and the helo was able to retrieve my frozen corpse, the cause of death pointed out in the MIR would not be "he was an unlucky fellow," but that I had failed to comply with NATOPS and good headwork . . .



I RECENTLY heard a couple of disturbing comments. The first, spoken by a fellow aviator, concerned a recent Mishap Investigation Report (MIR). He suggested that we stop commenting on how we would have performed differently in the same situation because we might place the MOJO* on ourselves.

The second comment, spoken by yours truly, concerned the decision to wear an anti-exposure dry suit on a twilight AIC hop. Even though at the time of man-up the sea-surface temperature was one degree above the NATOPS requirement, good headwork would dictate that I wear my suit because in a short while the sun would set, and a noticeable temperature drop would follow. But my flippant comment was that, "If I had to eject, it just wasn't my day, and wearing an anti-exposure suit wouldn't help anyway."

After reflecting on these two comments, I realized that the "it's in the hands of luck" attitude is hazardous to your health. Thus, I donned my poopy suit.

I am sure that if I did eject and the helo was able to retrieve my frozen corpse, the cause of death pointed out in the MIR would not be "he was an unlucky fellow," but that I had failed to comply with NATOPS and good headwork. In fact, in many cases the contributing factors of a mishap include a disregard of NATOPS, poor preflight planning and the failure to make a sound decision, then abide by it.

Knocking on wood when your starboard engine is on fire won't help much if you don't know your boldface procedures cold. Immediate recall of engine fire procedures, limitations, fuel migration problems and hydraulic system capabilities is a direct result of hours of NATOPS study and not related to the fact that you are wearing your lucky underwear that day.

*A mystical force which brings bad luck.

Thorough cross-country preflight planning will prevent a tragedy while crossing your fingers will only prevent you from dialing in the correct TACAN station. Know and brief your diverts. Are there any towers in the vicinity of NAS Divert? What's your Bingo fuel when you tell Approach that this is your last approach, and what's your no-kidding "turn and put your divert field on the nose" Bingo heading? What is your Bingo profile? Did you check NOTAMS for en route, destination and divert fields? How about weather? Will you wear a bag because the temperature will drop below NATOPS requirements after sunset? How about your divert MINS, MDA, HAT, RCR and a multitude of other acronyms which should be covered in your brief?

Finally, performance in the air is what counts. You can be the NATOPS expert on the ground, but applying that knowledge in the air is what saves assets, your wings and your life! Rubbing that rabbit's foot won't help you decide whether you should land at NAS Divert or fly the extra 100 miles to NAS Home so the maintenance officer can fix the hydraulics. Remember, you signed for that plane. Make a decision based on NATOPS and sound airmanship, then do it.

Next time you read an MIR, read it carefully. Have a discussion, preferably at an AOM, about the causes of the accident and how your squadron can prevent that same situation from happening. Luck cannot be relied upon to replace sound training and performance in any community. Thorough knowledge of his aircraft and the flight environment will prevent many an aviator from wishing on a star as he hangs in the straps. Aviation is not a game of chance. Save all your luck for that trip out to Las Vegas.

Ltjg. Davis flies for VF 142 based at NAS Oceana, Va.

A Slight Change of Plan

By LCdr. Mike Rowland

THINKING back to where my mind was that night makes me chuckle. It was my first long-range, night, overwater mission involving multiple in-flight plugs on an Air Force KC-10. I was looking forward to nine hours of flight time with mixed emotions, trying not to concentrate on being strapped to what I considered the world's hardest ejection seat and thinking about how I'd feel when it came time to recover back aboard after sunrise. Armed with two whoopee cushions, a box lunch and several soft drinks, my pilot and I manned up our trusty Intruder a little before 2200, ready for a 2300 launch. The flight deck was set up to launch the strike aircraft along with several KA-6D tankers. Carrying a representative ordnance load put us 3,000 pounds under max cat weight. The jet looked fine on preflight, started OK, and we ended up with a few extra minutes to double-check our end speed and review the initial rendezvous and push.

As we taxied up behind cat 3, one of our wingmen with the same ordnance load and configuration was just entering the shuttle. My pilot commented that he was a little surprised to see the deck shooting heavy A-6s off cat 3 since it was a different mod from the other cats with a slightly shorter stroke. We watched our wingie get a good solid shot and execute a smooth climbout.

Feeling a lot better now about cat 3, we completed the takeoff checklist, taxied into the shuttle, ran the engines up and checked things out. All of the instruments looked 4.0; on came the lights and we settled back, ready for a real bell ringer.

At the beginning of the stroke, the jet dipped slightly as usual. The initial tug felt good. We blasted down the deck. Just as we reached the end of the stroke, there was a loud bang and a flash of light somewhere on the left side of the aircraft. My eyes immediately scanned the altimeter, attitude, airspeed and vertical speed instruments. The jet did not appear to be in any hurry to climb, and it seemed like forever before the altimeter and VSI needles started to move.

I said something about keeping it climbing, and the boss was already yelling "Jettison, jettison!" on departure frequency. What really saved us in those first few seconds was my pilot's left forefinger, which became one with the emergency jettison button microseconds after the bang. Getting rid of 11,000 pounds of stores (later reported to have hit the water *before* the bow!) made all the difference between staying dry and going swimming.

After jettisoning, he raised the landing gear immediately. We still had unknown problems to solve, but first priority was getting the airframe **away** from the water. Ironically, whatever had failed had also frozen the primary attitude reference that the pilot was hawking; and as he continued to try to set the right attitude, the jet's nose climbed higher and higher. As the airspeed started to fall off and the angle of attack climbed, things got uncomfortably complicated. We both realized the problem at about the same time. When I called "Nose it over," he was already bringing the jet back where it belonged.

As the pressure altimeter passed 2,500 feet, with airspeed and angle of attack looking a *lot* better, we took our first deep breath and really started looking at all of the engine, oil and hydraulic indicators. All three landing gear indicated up, and the only abnormality was a left fuel-flow indicator reading about 10 percent low.

We figured that there might be a problem with the port engine as a result of some airframe failure during the stroke. My guess was that the strut had gone soft causing the nose to dip and tearing off the centerline drop-tank. We also started talking to the ship about this time. Although I am sure there were a lot of people who were barely restraining themselves, the UHF had been mercifully quiet while we were trying to keep everything dry.

We continued our climb overhead and joined with a mission KA-6D. Flashlight on, our wingie took a good long look at the whole underside of the aircraft. He pointed out that the engine bay door latches weren't fully closed. This raised thoughts of obstructed landing gear and other unpleasant things that go bump in the night. He said the underside looked "a little scorched" and that the pilot's boarding ladder was partially extended.

We decided to dirty up and conduct a slow flight check. After dropping the gear, we were rewarded with two down and locked main mounts and a tow link indication on the nosewheel. We asked for a second opinion from the wingie. This time the news was even worse. "Your nose gear's gone!"

Our nosewheel tires and swivel had sheared off on the cat shot, leaving just the upper part of the strut with the drag brace still attached. The ship had been talking about recovering us after the launch was complete. We had even dumped a bit of fuel in anticipation of this, but decided to secure the dump until we saw what our landing configuration was going to be. With this late-breaking news about the nosewheel, we became a confirmed divert with the KA-6D as escort.

The divert field was about 150 NM away; and we had plenty of gas, so we started a climb, remaining dirty to about 10,000 feet. We maintained 200 KIAS, and with our wingie's help, started making all the necessary calls. As we headed inbound, the pilot checked the low oil warning lights. The engine instruments all remained normal except for the slightly low port fuel flow. The low oil light came on with the test button depressed, indicating that we probably had lost or were losing some oil. About 30 miles out from the beach, the low oil warning light came on steady, and the oil pressure gauge started to fluctuate. The left throttle was retarded to idle, and we set ourselves up for a visual straight-in to an arrested landing primarily because we had the field in sight from 25 miles on a beautiful clear night. My pilot made a textbook landing, keeping the nose gear (or what was left of it) off the deck until the last second after we had already engaged the gear. We rolled out smoothly and came to a stop on centerline. After securing the engines and pumping open the canopy we jumped out, executed several high 5s (to the amazement of the fire truck guys), and surveyed the damage.

The aircraft nose was resting comfortably on what was left of the upper nose strut. The DRS Flir Turret (priced at a cool one million bucks) was about a foot and a half from the deck . . . out of harm's way. The real shock came when we looked at the port intake. The inlet guide vanes were approximately **30 percent obscured** by three large pieces of sheet metal jammed in against the first stage compressor blades. The initial stator and rotor blades were a shambles. The pilot's boarding ladder had extended in flight, and there was a 4-inch diameter hole where the boarding ladder closes into the airframe extending *all the way through the sidewall of the intake*. It was the worst FOD I had ever seen, yet the only indication was *reduced fuel flow*! The engine had continued to turn for more than an hour of flight time.

After performing a FOD walkdown back down the runway, we discovered a few pieces of the nose gear that had fallen off including the shimmy dampener. We closed up the jet as best we could and met our KA-6D escort buds in Base Ops to start the paper work drill.

Why is this story so long? Maybe it's because if it hadn't been for quick reactions on the part of a lot of folks (primarily the pilot), the second half of this article would have been about night overwater ejections. Maybe if the engine had seized (and it *looked* like it *should have*), we would have been looking at a no-nose-gear arrested landing at night with an excessively unbalanced thrust configuration that probably would have been simply too hard. The bottom line is that because a lot of things were done right and a lot of things *held together*, the jet will fly again. There are some things to think about:

Item No. 1: The cat shot. I've since talked to a good many aviators about when they decide they've gotten a good cat shot. Most of us tend to make an initial decision when we feel

the first tug and acceleration. You can't stop there. Pilots have to be spring-loaded and ready for a nasty surprise — even at the end of the stroke, which means watching the shot the whole way. Are you actually seeing what your end speed is? In this case, this one was in the ball park, but because of the attitude instrument problem and possibly some reduced thrust from the port engine, the airspeed actually decelerated as we drilled out from the ship.

Item No. 2: Ejection criteria. Both of us were all set to go. I had one hand on the handle. Had the jet even *started* to settle down from 100 feet, I was out of there. In restrospect, it seems that without a clear signal I waited to see what kind of *change* took place. Having one rock-hard plan ("I'm going when I see 40 feet on the radalt") may not be the complete answer. It may be too late.

Item No. 3: Prioritization and distraction. This may sound simple but all your attention must go to keeping the aircraft airborne. In this case it was a clear, black, horizonless night. You've got to focus on the right instruments and indicators, and next *cross-check one against the other*. Although the pilot claims I helped out by calling his attention to the secondary attitude indicator, it was my delta sierra for not picking up on the stuck VDI and going to MAG/VGI (alternate attitude source) earlier than I did. It was a great help for the ship to let us figure out the problem without injecting distracting questions at the wrong time, but I had already planned a self-imposed NORDO until we were ready to talk.

Item No. 4: Think ahead. Minutes after commencing the divert we requested an LSO on station. He made it, but his radios didn't. As it turned out we didn't need him, but . . . We also chose our primary divert field from several that were available because: We knew where we wanted to land, knew what to expect as far as the field layout and approach, and fuel was not a problem.

The idea here is to make your decision and stick with it unless there is a very compelling reason not to do so.

Item No. 5: You can't tell a FOD by its indicators. There's not much you can do but proceed with caution. We reduced power to idle on the engine with the problem. We considered securing it, but didn't like the prospect of an arrested landing with a known landing gear failure and no option to spool our shaky engine up if we needed it. We also weren't fond of relighting it for the landing once we had secured it. We had decided that even if we lost oil pressure, we were still going to use it for landing.

It's a good story, and I'm glad to be around to tell it to you. It only hit me much later that I missed out on the long-range mission and never got to log all of the flight time. I never got to use my whoopee cushion . . . but we did drink the cokes. ◄

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Hey, Man, Don't Blow Your Cool!

Name Withheld Upon Request

IT goes without saying that naval aviators are cool. Cool under pressure in the cockpit, cool with the ladies on the beach. It's drilled into us at Pensacola, and with good reason. When those moments of stark terror interrupt the hours of boredom, it requires a cool head in the cockpit to manage the situation. The pressure-cooker training we get weeds out those that can't keep their cool when everything is turning to worms.

I've always strived to maintain the image and keep my cool, but I surprised myself one night on a real, no-#@!* dark night approach to a CV. It was during workups, and we were working in a surge mode: flying our buns off and attending strike planning boards during the few hours we weren't airborne. We were also attending GQ drills and everything else that goes along with a workup cycle. Everyone was getting just a bit testy, but we were still working well together.

The planes were starting to show the stress of near-continuous flight ops, and little things were starting to break. On one plane in particular, we'd been having intermittent sticking of the AOA. The pilots would come back to the ship and write it up. The impact of the landing would jar it loose, and by the time the AEs would look at it, the AOA was working as advertised. The AEs tried replacing components, working blindly, but that didn't seem to fix the problem. Sometimes we would tap the gauge while airborne, and that would unstick it for a while. Unfortunately, it usually wouldn't stay functional.

This became more and more frustrating to the pilots, especially since we were flying airspeed approaches on dark, moonless nights. The airspeed indicator in the E-2C is buried under the glare shield, and out of the normal scan. It sure got my frustration level up, what with the heavy flying, the planning boards and trying to do my regular job, too. One night I finally blew my cool.

We were on our way down the chute on a dark, moonless, rainy, late night recovery. We had received several "Delta 4s" from marshal, and we were approaching our bingo fuel state. By the time we finally pushed, we figured we'd be about bingo plus one pass on the ball. The way the recovery had been going, we were already looking at the approach charts for NAS Southeast, our primary divert.

These delays pumped the frustration level even higher, especially when we found that part of the reason for our delayed recovery was due to other aircraft being too far out to make their push times! Being the biggest plane on a small deck, the flight deck crew couldn't take us out of sequence. None of us particularly wanted to go to the beach, because we knew that we'd lose a lot of needed rest, as well as short the squadron a badly needed plane.

So there we were, on our way downhill, tired, with sticking AOA, short on fuel, getting delay vectors from CATCC, in the middle of a dark and rainy night. The sticking gauge was the last thing I needed, and I started tapping it with my flashlight to get it to work. Dirtied up on final, I was hitting it every mile or so from 10 miles out. Finally, at about four miles, I hit that poor defenseless gauge a fatal hit. I broke the glass and it quit altogether. I wouldn't have to see any more intermittent AOA indications — I'd fixed it once and for all.

I had this sick, guilty feeling from having broken a part of the airplane. *That* was one distraction I sure didn't need. But I calmed down and flew a decent pass to a trap. Man, did I feel bad when I got out of that plane and told the maintenance crew that the plane was down for broken glass in the cockpit! Fortunately, all the glass stayed in the face of the gauge; none of it fell out on the cockpit deck.

I told the flight deck coordinator and AE troubleshooter who met the plane, the maintenance officer, the skipper and the XO. A couple of hours later I went down to the AE shop and apologized to them for making extra work that they really didn't need right then. Nobody chewed me out; nobody bit my head off, though I saw a look from one of the AEs that indicated a strong desire to do so. They all very gracefully accepted my apology, and said that they understood my frustration and felt the same thing over this phantom gripe. I felt worse about the thing than anyone else.

Some junior pilots may think that a senior pilot with 4,000 flight hours and 10 years in the cockpit probably doesn't have a lot more to learn about flying. They are wrong! I learned a valuable lesson that night. The airplane is *not* the place to vent one's frustrations. *Anywhere* else is preferable to the cockpit. Even the ready room with everyone watching is better. Don't worry about letting people see you blow your cool; what's important is that if you must blow up, do so in a harmless place. The poor airplane is defenseless. It can't hit back. It will just sit there. ◄

Following That Sixth Sense

By LCdr. Dick Sears

. . . Being an "all-weather pilot," I hesitated to return in the middle of the mission with plenty of fuel; yet, my *sixth sense* told me to leave. I'm glad I listened . . .

WE were briefing in CIC for the second event of an ASW mission. The weather that afternoon, as it had been for several days in the Northern Sea of Japan, was overcast with visibility of about four miles. The schedule called for a crew swap, hot refuel and hot reload of sonobuoys in our ASW-configured SH-2F. My maintenance officer reported that the aircraft had been flying well. We were eager to chase the "real thing." The ship, a *Spruance*-class DD, held a solid subsurface contact to the west of our launch position.

En route to the area of probability (AOP) we encountered light rain showers. Our anti-submarine sensor operator (AW) supplied us with a radar surface summary of multiple contacts in the area. We held subsurface contact with our sonobuoy pattern for about 20 minutes before losing both sonar and buoy information. After trying to regain contact for a brief period, we were directed to investigate specific surface contacts.

In turning toward the closest contact, I noticed that it was already fairly dark although it was just a few minutes past sunset. We turned to the east and found the visibility starting to decrease because of rain showers. A visual identification (VID) on our first contact would be extremely difficult. After being directed to investigate the remaining contacts in our area, we soon realized a small area of rain showers had become a large cell which completely obscured the contacts in our search area. Word from the ship was that a line of showers extended along the horizon. We were now 35 miles from homeplate.

Having no success with VIDs from outside our assigned surveillance limit, we asked for further tasking and a weather update from the ASW air controller (ASAC). He reported a large cell developing in their area with heavy rain and increased seas that appeared to be closing.

I had experienced bad weather at sea before, and it certainly wasn't uncommon in the Sea of Japan in November. These cells were larger than normal, though, and I felt the cards starting to stack up against us. In the absence of new tasking, I decided to return to the ship. As an "all-weather pilot," I hesitated to return in the middle of a mission with plenty of fuel; yet, my *sixth sense* told me to leave. I'm glad I listened.

As we closed homeplate, the aircraft was tossed around in turbulent air, and it became difficult to maintain heading. Updrafts and downdrafts tugged at the controls, while lightning flashed in the rearview mirror. The ASAC held us in radar contact and reported rapidly deteriorating weather at homeplate. Flight quarters had been set and winds, pitch and roll were holding at the edge of the envelope.

As we approached the ship, the ASAC lost radar contact at 1.5 NM. The AW was always in the habit of backing up shipboard-controlled low visibility approaches (LVA), and he immediately provided vectors. I had the utmost confidence in my AW since we had spent many hours training for self-contained radar approaches (SCRA). His reports and the TACAN agreed on position, but we were rapidly approaching one-half mile with no visual contact.

Just inside one-quarter mile, a strobe light came into view, and my heart rate began to slow. We reported on final with gear down and locked but waved off since the winds had shifted drastically. My co-pilot raised the gear, and we executed the wave-off. I hated having to lose sight of that ship. The OOD maneuvered the ship to regain suitable winds and gave us a green deck as we again turned to final.

I had often wondered whether all those dark night LVA/SCRA approaches would pay off. Now my question was answered. We received wave-offs on that and three subsequent approaches due to major wind shifts across the bow. On the last wave-off the low fuel light came on and I realized that if winds, pitch and roll were out of limits on my next approach, I would be forced to accept what was available and land. Each approach was a challenge. As we intercepted the final approach course, the winds seemed to hold, and pitch and roll remained right at the edge of the envelope long enough for us to land. Fuel on shutdown read 280 pounds.

The intensity of the weather surprised all of us. We had been accustomed to scattered squalls in the previous week. This turbulence and rapid deterioration of conditions were impossible to predict. As a single ship we had little indication of changing conditions aside from a radar picture indicating the depth of the storm. The initial indications were harmless enough, and we had anticipated little difficulty.

Topics we discussed after the recovery included:

- With less fuel, what winds did we consider acceptable for trying to land. How could we attack the problem? What were the alternatives?
- Keeping our AWs precise and sharp on SCRA approaches paid big dividends.
- Wind, pitch and roll limitations are IAW NATOPS. You may be forced, however, to accept conditions out of limits on some occasions. You should know how far you feel capable of pushing the envelope in extremis.
- Plan ahead; the OOD and TAO must ensure they stay aware of weather ahead. It is not uncommon for LAMPS to operate (while on a mission) in a totally different environment than that of the parent ship. Keep the aircrew informed.
- ASACs must be able to keep the aircraft on radar right up to the missed approach point. Losing radar contact with the aircraft at any greater distance is not acceptable. Don't be satisfied to hold the aircraft "in the dark."

Something besides the obvious caused me to decide to return to the ship early that evening. How many times as aviators do we debrief ourselves on the mistakes we made by saying, "I should have paid attention to my sixth sense"? You can call it intuition, an educated guess or a little voice. I think it is our common-sense experience and training guiding our subconscious. It pays to listen! ◄

LCdr. Sears is safety officer and an SH-2F pilot with HSL 37, NAS Barbers Point, Hawaii.

WHITE-OUT:

THE PHENOMENON, N

By LCdr. Dana D. Barclay

ANYONE who has been part of an *extended* at-sea deployment can readily attest to the symptoms, difficulties and cure associated with the affliction known as white-out. If you have not yet been there, you'll have to trust me on this one.

On the other hand, until recently, the majority of us have had little opportunity to experience the weather phenomenon called white-out. Usually associated with the land of the MacKenzie brothers in the Great White North, this insidious hazard deserves increased attention as NORPAC and NORLANT operations receive greater emphasis.

While not all-inclusive, the following are typical causes with some resultant effects of the phenomenon:

Overcast white-out — Produced when light reflects between the snow surface and the base of a complete cloud cover. Perspective, involving the judgment of distance, is limited to a few feet; but actual horizontal visibility of dark objects is not materially reduced.

Water-fog white-out — Produced by thin clouds containing supercooled water droplets, with the cloud base usually in contact with the cold snow surface. Visibility, both horizontally and vertically, is affected by the size and distribution of the water droplets suspended in the air.

Blowing-snow white-out — Produced by fine blowing snow agitated from the snow surface and suspended in the air by winds of 20 knots or more. The suspended grains of snow reflect and diffuse sunlight, reducing visibility.

NOT THE AFFLICTION

Precipitation white-out — Although all falling snow reduces visibility, small wind-driven snow crystals falling from low clouds, above which the sun is shining, produce a white-out condition. The multiple reflections of light between the snow-covered surface and the cloud base is further complicated by the spectral reflection from the snowflakes and the fact that the falling snow obscures landmarks.

Even among aircrew familiar with these winter phenomena, costly mishaps continue as a result of failing to recognize the seriousness, and failing to take positive, preventive precautions. Within NATO files, there are mishaps documented in which pilots, although aware that the snow-covered ground is blending with an overcast, have continued flying without adequate visual references. The wreckage has revealed altimeters set correctly, along with adequate charts and flight plans. The trouble lies with the fact that unless there is a *complete* lack of visual contact, there is a tendency to use whatever exists as the reference: a line of trees, bushes, a fence or a road. As white-out comes from indirect light with no apparent source, shadows are minimized.

For example, the trees observed ahead could very well be at the *bottom* of a hill. The snow-covered hill itself can blend perfectly with the sky. A road or fence line as a simple reference can confuse the senses, and cause vertigo and disorientation unless immediate reference is made to instruments.

Low-level routes with legs over large lakes are perfect setups for white-out during overcast days. Visibility can be 10 miles under a 3,000-foot overcast, but you may as well stick your head in a snow bank if *good* visual reference points don't exist and you aren't on instruments.

The solution to white-out:

Preparedness — Know your route; not just check points and fixes, but terrain. Is it flat, hilly, up-slope or down-slope? Similarly, know *where* you are on your route — *don't* depend on "HAL," (the INS) to do *your* NAV.

Anticipation — As with any other vertigo-producing phenomenon, if there is any doubt, get on the gauges, ensure adequate terrain and obstacle clearance and airspeed, and go IFR.

Don't play Instruments, Visual, Instruments, Visual — Especially during an approach to landing in white-out conditions, transition to a visual approach *only* when reliable visual references (i.e., meatball or VASI) are available, either prior to or at minimums. Anticipate poor depth perception (like at the boat at night) and lower visibilities in the latter stages of final. Also like at the boat, fly the ball/VASI to touchdown where runway contact comes as a surprise.

Following these few guidelines and knowing the conditions favorable to white-out (the phenomenon), you'll undoubtedly live to weather — pun intended — white-out (the affliction). ◄

LCdr. Barclay is the F-14 analyst in the Aircraft Operations Division, Naval Safety Center, Norfolk, Va. He is an acknowledged expert on all types of white-out.

. . . The thought of ejecting into the icy waters below sent sharp chills down my spine; not only would the survival time be low in 40-degree water, it would be difficult or next to impossible to find us in this weather . . .

Another Gnarly Night In NORPAC

By Lt. Ted Rutherford

WE'D been operating in NORPAC for the last two weeks. It was the beginning of our seven-month deployment. Weather conditions included extremely low ceilings, poor visibility, rain and fog, and to top it off, water temperature a balmy 40 degrees Fahrenheit. After getting aboard with a rare foul weather night OK 4, I entered the ready room and was told: "Hey Wacko, leave your gear on. Since you're behind on traps, we're sending you back out tonight."

What a way to catch up! I thought what-the-heck, it's only a one-hour night proficiency hop, with lots of gas to get rid of. In other words, max burner ("rocketship") time. If I did just as I had done an hour before, it would be an easy OK, right?

Launch was uneventful, with a max performance climb to 38,000 feet for some stargazing and supersonic cruising. "We better head on over to marshal," I said. En route, the master caution light started to flicker, rudely directing my attention to a hydraulic pressure light and fluctuating combined hydraulic pressure gauge. "Looks like we're going to lose the combined side; better get the probe out, just in case." "No problem," I thought, "it's almost recovery time anyway." "Mace, go ahead and get the book out and we'll double-check our procedures. Since we have plenty of gas, I'll drop the gear now while we still have some combined pressure left."

Selecting the gear handle down yielded these indications: nose gear down and locked, main gear unsafe down and the last of the combined hydraulic pressure depleted to zero. "Mace, we better declare an emergency and request immediate landing. I'll blow the gear down."

Everything started to happen at once. The gear and flaps came down painfully slowly; everyone started talking and asking questions at once. "201 marshal, state your problem." "201 rep, is your gear down?" "Is the BI-DI off?" "Wacko, Minnow on TAC; what's going on, over?"

Everyone wanted to get in his two bits worth of information. I had been arcing around out there at 50 miles, and figured that I had better get headed inbound. As we started inbound, we dumped down to landing weight and finished the last of our NATOPS procedures. We then reported to marshal that we would have no aux flaps, direct lift control, speed brakes, wheel brakes or pitch and roll SAS. My Tomcat was still flying, although it handled like a dump truck. As we descended to Angels 1.2, marshal came up with some encouraging words: "Ninety-nine Wolfpack — Battlestar weather three hundred measured overcast and one-half mile visibility in fog and light drizzle."

Super! This is just what we needed. "Hey Mace, this must be what we're getting paid the big bucks for . . ." I was also distracted by the thought of another squadron bud who was previously in the same situation: combined hydraulic failure at night. He received a foul-deck wave-off on his first pass, and while on downwind he also lost the flight hydraulic system. When the backup flight module was insufficient to maintain enough control surface authority to land safely, he was forced to eject.

The thought of ejecting into the icy waters below sent sharp chills down my spine; not only would the survival time be low in 40-degree water, it would be difficult or next to impossible to find us in this weather. At three miles we commenced our descent on glide slope (thank God for needles) as the vertigo tried to set in.

My RIO did an outstanding job backing me up with self-contained CCA and VSI calls. "Two miles, on and slightly left, right two," then "one mile slightly above slightly left." Just inside one mile, I started glancing outside as was my normal habit pattern, seeing nothing but the eerie glow of the red refueling probe light. "Three-quarters of a mile, slightly above and on course, call the ball."

"Mace, I don't see a thing!"

Mace reported Clara while I kept trying to visually acquire the boat. "201 Paddles, contact, don't climb, little right for lineup."

We finally broke out, and I called "Ball!"

"Roger ball, you're high!" Boy, no kidding — almost two balls high. I've

got to work this thing down or I'll be going around. Alright, it's starting down now, a little power and a little attitude to catch it — the infamous hook extension maneuver. Then one of the greatest feelings on earth, that reassuring tug of a lucky 4-wire on a dark and scary night! Ahhh.

The failure was later determined to be a cracked gun drive dual flow control valve, with a resulting loss of all combined hydraulic fluid. Many lessons were learned or relearned:

- When blue water, with some sort of an emergency that requires an immediate landing, put the needle on the nose. Head back to the ship at an altitude high enough to avoid the marshal pattern or tanker circle. This enables CATCC to quickly vector you to final. If things get really ugly, and you have to jettison your sick aircraft, you will be close enough to the ship that the helo can rapidly pick you up, minimizing time in the water.
- *Aviate, navigate, communicate!*
- Make the pass count. Do not be distracted by thoughts of what happened to someone else, the weather or fire lights. Make the pass you're flying the best you can. You may not have a chance for a second one if you bolter or get waved off.
- Have a game plan for emergencies that are either time critical, affect the flight qualities of your aircraft, or require a different scan pattern in order to successfully land a disabled bird (i.e., split flap/slat, single-engine, no flap, truck or super truck, binding controls, partial panel, battle damage or any combination thereof.) A good way to review is at AOMs or safety stand-downs in order to get as many different inputs and ideas as possible.
- The most important thing is to maintain a calm, clear head. *Think*! Don't let yourself get behind the aircraft.

We wear wings because we are the operators who make the decisions and make it happen. Fly safe and good hunting. ◄

Lt. Rutherford flies F-14s with the VF 111 "Sun Downers," in USS *Carl Vinson* (CVN 70). He is airframes/corrosion control branch officer and squadron LSO.

. . . Statistics show that a single-seat tactical aircraft can be a high-risk plane for a nugget . . .

Are You A High Risk Pilot?

By M.S. Borowsky, Ph.D., and Bud Baer

THE A-7 was making an early night approach to the carrier. Responding to power calls from the landing signal officer, the pilot applied power and raised the nose to an excessively high attitude. In a severe decel, the Corsair II struck the ramp. Engulfed in flames, the A-7 skidded to a stop. The pilot miraculously got out under his own power as the crash crew converged on the scene.

The cause of this mishap was later diagnosed as pilot error: improper use of flight controls in the air. Another factor noted was the pilot's lack of experience in the A-7. It appears reasonable that a pilot with relatively few total hours in type may not be as capable as one of the squadron's veterans.

Are *your* chances of having a mishap greater or less than others in your squadron? How much greater? How much less?

These questions are hard to answer because of the many variables that affect mishap probabilities. Data used *throughout this article* to determine the mishap potential in the individual aircraft communities is based on a pilot with *less than 300 hours* in *type and only* 450 to 750 *hours total time*.

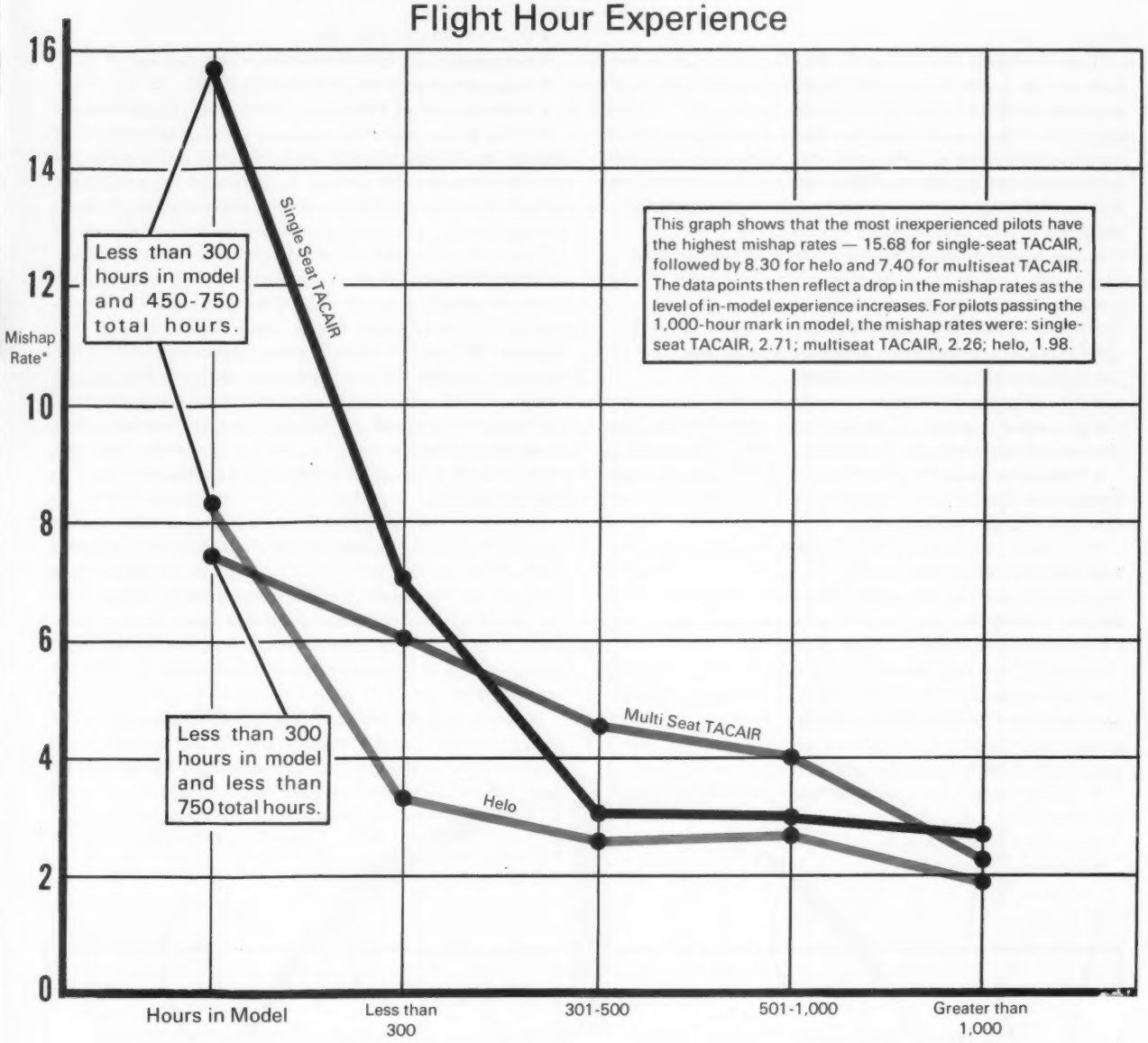
The statistics show that a single-seat tactical aircraft, such as the A-7, **can** be a high-risk plane. If you have less than 300 hours in type and between 450 and 750 total time, your chances of being at fault in a Class A mishap are *four times greater* than your community average. Your mishap probability decreases significantly as your in-type hours increase, as shown on the graph.

Typical mistakes made in single-seat tactical aircraft include:

- Failure to recognize approach to a stall.
- Improper response/technique for CV/FCLP landings (improper scan/correction for meatball, excessive sink rate).
- Violation of general air discipline/SOP.
- Continuation of VFR under unfavorable conditions.
- Failure to recognize dangerous situations and errors in judgment, including physical or mental "errors," such as fatigue, vertigo, fixation, disorientation and distraction.

Your *rate* of making most of these mistakes decreases as you gain experience, but then you become statistically more susceptible to a different set of mistakes — *exceeding stress limits, inadequate flight preparation and improper instru-*

Class A
Flight/Flight Related Pilot Error Mishap Rate
vs.
Flight Hour Experience


16
14
12
10
8
6
4
2
0
Mishap Rate*
Less than 300 hours in model and 450-750 total hours.
Single Seat TACAIR
This graph shows that the most inexperienced pilots have the highest mishap rates — 15.68 for single-seat TACAIR, followed by 8.30 for helo and 7.40 for multiseat TACAIR. The data points then reflect a drop in the mishap rates as the level of in-model experience increases. For pilots passing the 1,000-hour mark in model, the mishap rates were: single-seat TACAIR, 2.71; multiseat TACAIR, 2.26; helo, 1.98.
Multi Seat TACAIR
Less than 300 hours in model and less than 750 total hours.
Helo
Hours in Model
Less than 300
301-500
501-1,000
Greater than 1,000

*Number per 100,000 Flight Hours

Graphics by Frank L. Smith

ment procedures.

If you're flying a multiseat TACAIR plane, such as an A-6 or F-14, and if you have less than 300 hours in type and less than 750 hours total time, your chances for safer flight improve. Your odds of causing a Class A mishap are *two times higher* than the average of your community. You'd better be nice to your B/N or RIO; he's an important safety factor. As in the A-7, your mishap probability significantly decreases as your in-type hours increase.

Major problems encountered in the multiseat TACAIR community include the following:

- Failure to recognize dangerous situations.
- Preoccupation at a critical moment.
- Insufficient airspeed for the intended maneuver.
- Improper spin recovery technique.
- Improper post-stall gyration recovery technique.
- Improper response/technique for CV/FCLP landings (attitude control, excessive sink rate and glide slope control).
- Physical or mental "errors," such as fatigue, fixation and distraction.
- Lack of aircrew coordination.

Your *rate* of committing most of these errors decreases as you gain experience. *But continue to watch out for insufficient airspeed, improper spin recovery and violation of regulations/NATOPS (general air discipline and continuation of VFR under unfavorable weather conditions).*

If you're a helo pilot, what are your odds of being involved in a Class A mishap? If you have less than 300 hours in model and between 450 and 750 total hours, they are 3½ *times greater* than your community's average. Your mishap probability significantly decreases as your total hours increase.

If you **do** make a mistake flying your helicopter, chances are it probably will include:

- An error in judgment.
- Lack of crew coordination.
- Poor navigation planning.
- Accepting your helo with known discrepancies.
- Violation of general air discipline, SOP.
- Continuation of VFR under unfavorable conditions.

As you gain experience, continue to keep alert to avoid making any of these mistakes. Other areas of concern include fuel mismanagement, distraction, failure to recognize dangerous situations, misuse of collective pitch, inadequate lookout and failure to compensate for wind.

Those of you who fly training aircraft also have to be on your guard. If you're an instructor pilot with less than 300 hours in trainers, your chances of being at fault in a Class A mishap are *three times higher* than for instructors with between 300 and 750 hours in training aircraft and *over five times greater* than for instructors who have over 750 training hours.

If you're a student pilot, your pilot error mishap rate *increases* as you advance. Yes, we said *advance*. Does this mean that the more the student learns, his chances are worse? Not exactly.

The risk in the early stages of training increases on that eventful day when the instructor says, "Take it up . . . alone." Half of the student pilot error mishaps occur when flying without an instructor. Typical student pilot mistakes are attributed to disorientation, improper spin recovery technique, violation of general air discipline, inadequate flight preparation and failure to maintain sufficient airspeed for specific maneuvers.

Statistically and logically, the good news is that the pilot with more time under the belt in a particular aircraft is less likely to have a pilot error mishap than a pilot with substantially fewer hours. And that's the way it should be! ◄

Dr. Borowsky is the head of the Statistics and Mathematics Department of the Naval Safety Center. He has a doctorate of mathematics from Drexel University, Philadelphia, Pa.
Bud Baer is a staff writer for Approach.

Directory available

THE Naval Safety Center has produced a "Guide to Safety Audiovisual Materials" directory. The guide contains a listing of all safety-related audiovisual training aids such as films, videos and slide presentations available from Naval Education and Training Support Centers. The guide lets safety training personnel know what is available to assist them in their training programs. It presently is in distribution to operational commands. If your command does not receive a copy within the next two months, contact the Naval Safety Center, Safety Education and Training Department, at (804) 444-4005 or Autovon 564-4005, and a copy will be sent to you.

High Volts

By Peter Mersky

TEN years ago, as a reserve lieutenant, I was heavily into bagging flight time. As an O-5, I still bag, but the years have refined my technique, and I am now a highly-qualified mooch. One August morning, I got a call from a squadron with which I occasionally flew. The CO needed flight time and was planning a cross-country. None of the regular RIOs could go on such short notice. Was I interested? What a question.

It was a routine flight, down and back, about four or five hours total. We got our weather brief, and the CO and I went over ejection and radio procedures. I'd handle the communications, which was fine with me.

The flight south was OK. We landed, and as we opened our canopies, the hot, humid Louisiana air hit us squarely in the face as we taxied in. No sweat (no pun, either).

We refueled, refiled and had a couple of sodas and hamburgers. Then mounted our trusty F-4 and took off. By now, into the mid-afternoon, the usual buildups were everywhere, with tops we estimated to be over 35,000 feet. Big 'uns. No matter — we pressed on, calling Center occasionally.

About one hour after takeoff, we saw a long line of huge thunderbumpers directly in our flight path.

"Call Center," the CO grunted, "and tell them." I dutifully made the transmission, and the man on the ground told us we could detour if we chose.

"Well, I don't know," the CO said. "Maybe we'll just push on along the edges. Doesn't look too bad after all." From where I sat, it didn't look too good either, but since I was "just along for the ride," I swallowed and told Center we'd be OK.

We penetrated one cell, and except for some turbulence and a little rocking and rolling, we emerged unscathed. Not so the next one. As we went through the second buildup, there was a tremendous **crack** immediately behind my seat, then an almost simultaneous shock ahead of the front cockpit. The Phantom shook and the CO bawled, "Tell them we're making a 180! I'm getting out of here!" With that, he hauled the F-4 around; and we exited the CB, a little worse for wear. We spent the rest of the flight dodging the buildups until we were finally in the clear.

We landed back at our base, unstrapped and climbed out. The CO was on the ground; and as I made my way down, he grabbed my leg, nearly pulling me off the side of the aircraft.

"Look at this," he demanded, dragging me toward the radome. He pointed dramatically at the white fiberglass. It looked as if someone had taken an ice pick and gouged a long gash from the nose.

"Lightning strike," he declared. I just gulped and said nothing. That's what that second blast had been. I climbed back up to look behind my seat but didn't find anything.

We had been extremely foolish; I include myself because I could have said *something*, even at the risk of angering him. We'd also been extremely lucky.

1st Lt. Bruce Neilsen (left),
Cpl. Pablo Perez (center),
Capt. Greg Barnes (right).
LCpl. Mike Turner not pictured.

Capt. Greg Barnes, USMC
1st Lt. Bruce Neilsen, USMC
Cpl. Pablo Perez, USMC
LCpl. Mike Turner, USMC
HMM 163

Capt. Barnes, 1st Lt. Neilsen, Cpl. Perez and LCpl. Turner were crewing YP-24, a CH-53D involved in a Cobra Gold exercise in Thailand. The mission was to internally transport vehicles from the USS *Peleliu* (LHA 5) to an inland landing site.

While on final approach to the landing zone, on the same heading as on the previous two sorties, 1st Lt. Neilsen (co-pilot) reported that he was approaching the limits of tail rotor control. Capt. Barnes, the aircraft commander, ensured that the engines were at full power, and took over the controls to initiate a wave-off to the right, so as to avoid the lead aircraft. The aircraft had yawed 30 degrees to the right, and despite an increase in airspeed during the wave-off, the aircraft continued to spin to the right. The pilot diagnosed the problem as a control malfunction instead of a loss of tail rotor authority. He applied power to avoid the treeline surrounding the landing zone, which in turn made the helicopter rotate faster. Confronted with these problems, Capt. Barnes elected to land back in the original landing zone. After numerous revolutions, he

BRAVO ZULU

was able to maneuver the helicopter back over the landing zone by primarily utilizing cyclic control inputs. Cpl. Perez, the crew chief, and LCpl. Turner, the first mechanic, continued to provide terrain avoidance calls through this phase of the approach. Near the intended point of landing, with the aircraft at an altitude of approximately 50 feet, the collective was lowered which reduced the rotation sufficiently to allow a successful running landing to be made with only a slight right rotation.

Post-flight inspection centered on the nut that retains the tail rotor pitch beam on the pitch beam shaft. It had broken torque and backed off enough to severely limit tail rotor control.

Lt. Neil Sullivan
VFA 132

During a Dissimilar Air Combat Training (DACT) flight, Lt. Sullivan executed an unloaded, rapid right reversal maneuver which was shortly followed by HYD 1A, HYD 1B and HYD 2B cautions. MECH ON, AIL OFF, RUD OFF cautions appeared next, as virtually every channel in the flight control matrix failed. Attempts to reset the flight control system resulted in the aircraft violently pitching nose down and rolling right. Minor stick movements to offset the deviations resulted in PIO. While Lt. Sullivan struggled to maintain control of his crippled Hornet, his wingman declared an emergency and coordinated communications for the section's return to NAS Cecil Field.

Being the first aviator to ever fly the F/A-18 in the "MECH ON/AIL OFF/RUD OFF" condition, Lt. Sullivan lowered the landing gear by normal means and carefully checked the handling characteristics of the aircraft down to 190 KCAS.

A decision to shoot a flaps-up approach to a short field arrested landing was based on the possibility that any demands placed on an already severely degraded hydraulic system by flap actuation might cause additional lateral and pitch control problems. Lt. Sullivan flew a 20 NM straight-in to a low, flat 200 KCAS approach. A squadron LSO closely watched Pirate 200 touch down 150 feet prior to the E-28 arresting gear, arresting at 190 KCAS.

Post-flight inspection revealed the cause of the compound hydraulic failure to be a broken manifold bracket on the port stab servocylinder, where hydraulic lines from two otherwise independent systems were broken. Total elapsed time from first caution to arrested landing was 29 minutes.

Lt. Col. Novatus N. Kirby, USMC
VMA 214

While flying a routine low-level navigation hop, Lt. Col. Kirby, Commanding Officer of VMA 214, heard a metallic clinking sound coming from the rear of his A-4M Skyhawk. The sound was followed by a loud bang. The fire warning light and both utility and flight control hydraulic lights illuminated. He immediately climbed, reduced power and requested a visual check from his wingman. The wingman saw no smoke

or flames, but noted there were large scorch marks on both sides of the fuselage.

Determining that the aircraft was still controllable and noting that engine instruments were indicating normal parameters, Lt. Col. Kirby declared an emergency and proceeded to the nearest military divert field. He ruled out other, closer civilian fields based on runway length and dense civilian populations. While en route he experienced severe engine vibrations at the NATOPS prescribed 80-82 percent engine RPM, so he cautiously advanced the power to approximately 86 percent. This higher power setting re-illuminated the fire warning light, but this was more acceptable than the severe engine vibrations.

Approaching NAF El Centro, Lt. Col. Kirby and his wingman considered his upcoming precautionary approach. He had no airspeed indications, and would have to execute a no flap, no speed brake approach to an arrested landing while manually lowering the landing gear. Even at the higher than normal airspeed and power setting, the approach was executed smoothly by the experienced Blacksheep commander. With his wingman giving him airspeed calls, he secured the throttle at 120 feet AGL, flared the aircraft and made a textbook emergency shortfield arrestment at 160 knots.

Post-flight examination revealed that the engine had expelled several turbine blades through the engine casing and various airframe components. This resulted in a utility hydraulic failure, extensive bleed air damage to the aft half of the aircraft and severe electrical malfunctions.

Lt. Scott Craig
VA 22

Immediately after a dusk cat shot during blue-water operations from USS *Enterprise* (CVN 65), Lt. Craig noticed a platform caution light and subsequent platform failure in his A-7E. When he attempted to cross over the attitude of his standby gyro to his ADI, he discovered the standby gyro had also failed. As he retracted the external power package — it's SOP to take all night cats with the EPP extended — YAW STAB disengaged, pitch and roll trim became inoperative and all instrument lighting was lost. Re-extension of the EPP did not regain any of these lost systems.

Lt. Craig started a slow turn toward the ship, began dumping fuel and asked for priority in the Case III recovery pattern before complete

darkness settled in. With no attitude instruments or heading indication, he requested a no-gyro approach. When he lowered the landing gear, he found that the angle of attack gauge and indexers were also inoperative.

Another A-7 joined on Lt. Craig's wing as he approached final. The A-7 pilot told him that his nose gear was cocked 90 degrees to the right. With no YAW STAB, no AOA or attitude indicators, pitch trim stuck at 6 degrees nose up, roll trim stuck at 3 degrees right wing down, and barely enough light to see the airspeed indicator or altimeter, Lt. Craig flew an excellent carrier pass to an arrestment.

Lt. Craig flew this approach without any attitude instruments or angle of attack reference and with very difficult aircraft control system response. Superior airmanship and quick reaction by Lt. Craig, plus the excellent assistance provided by "Climax" CATTC controllers, brought this crippled aircraft back aboard just prior to total darkness, preventing a possible ejection situation.

Lt. Douglas H. Stone
Ltjg. Craig N. McCartney
VT 6

As lead aircraft in a formation flight, Lt. Stone and his student, Ltjg. McCartney, were flying straight and level at a normal cruise power setting. Suddenly, torque rapidly climbed to 1,230 foot pounds. Lt. Stone took control and tried to adjust the PCL to regain normal power. Upon confirming a fuel control unit malfunction, he started a climbing turn to home field while informing his wingman. Ltjg. McCartney confirmed that all other engine parameters were within operating limits for the T-34C. They decided to continue the climb towards home field with Ltjg. McCartney monitoring the instruments for secondary indications that might require a divert to an outlying field. With their wingman flying chase, Lt. Stone and Ltjg. McCartney reviewed NATOPS procedures for an uncontrollable high-power condition. Reaching 10,000 feet MSL and within gliding distance to home field, Lt. Stone secured the engine and executed a perfect emergency landing profile (ELP). He followed this with an "uneventful" dead stick landing. Removal and investigation of the fuel control unit revealed the NG governor input shaft bearing had failed causing the shaft coupling to fail and the engine to go to an uncontrollable high power setting.

Lt. Douglas H. Stone (left),
Ltjg. Craig N. McCartney (right).

The Military Flight Instructor:

Legend or Loser?

By LCdr. Scott Olin, USCG

LCdr. SAVAGE was a legend. He rejoiced in reminding the air station ensigns he had worn out more helmet bags than they had worn out socks; that the volumes of his bound logbooks took up more space on the ops center shelf then all theirs combined. He dazzled them at the club with his tales of dark and stormy nights and victories won. His chest full of ribbons gave credence to his only slightly-embellished stories. LCdr. Savage had seen it all, done it all and been it all.

Ltjg. Samo was a dedicated worker and eager to improve his flying skills. He was excited to find himself in the upgrade syllabus, assigned to LCdr. Savage — a real bonus. Samo hoped he could glean pearls of wisdom from LCdr. Savage and the legendary flight instructor could transform him from a young rookie to a young but proficient aircraft commander. Samo studied and knew the book. It was time for his first flight with LCdr. Savage.

"We'll do it in the air, where it counts," said Savage in lieu of a brief. Once in the pattern, LCdr. Savage took the aircraft

JOCS Kirby Harrison

controls to demonstrate one for his student. Samo was impressed by how effortlessly the aircraft ran through the perfect maneuver. It seemed that LCdr. Savage only had to *think* and the aircraft responded.

"Wow! How'd you do that, sir?"

"It's all in the feel and lots of practice, son," Savage replied. "Now you try one."

Samo took the controls and began the maneuver. Darn, a little high and 10 knots too fast, he thought to himself.

"You're a little high and 10 knots fast," commented the instructor.

Samo made an adjustment and concentrated on his outside checkpoints. Glancing at his instruments, he noted 5 knots slow and a little low. Darn, you overcontrolled, he chastised himself.

"Samo, you're low and 5 knots slow. You've overcontrolled."

Why, thought Samo?

"You've got to get the feel, Samo. Practice, lots of practice."

The rest of the flight went the same way. Samo made it through, but the fountain of knowledge he hoped to tap never flowed. The lieutenant commander was an astute critic and pointed out errors meticulously, but there was precious little gouge on how to correct those mistakes. Though it would have been blasphemous for the words to cross his lips, Ltjg. Samo knew in his heart that a bit of the legend had died. He's not an instructor; he's only an in-flight critic.

For years, the Coast Guard has taken those with a little seniority, a little flight time, a reputation as a good stick, and perhaps a little legend, and blessed them with the title of flight instructor. Unfortunately, in and of themselves, none of these ingredients necessarily translates into good instructors. What is good instruction? Who's going to teach us?

By the time our pilots reach field units, they have completed flight school and aircraft type and mission training. They certainly know if and when they're off altitude and airspeed. With time and exposure, it is realistic to believe most of them will progress to aircraft commander.

Our job as instructors is twofold. 1) Keep them safe while they learn; 2) reduce the time it takes to learn by trial and error.

Flying is a mental and motor skill, like walking or driving a car. The more often the task is performed, the less the conscious mental input for the motor skill is needed. When was the last time you had to think about the detailed actions of driving your car? Samo had some insight when he knew LCdr. Savage had only to think about what he wanted and the aircraft responded. The mind receives stimuli from the senses and transmits signals to the limbs for response. After much repetition, a given set of stimuli produces an almost automatic response requiring very little conscious mental effort. So when LCdr. Savage was asked "How do you do it?" he really didn't know at a conscious level. But that *is* the job of every flight instructor: to bring that which he does subconsciously to a conscious level and teach it.

Instructor pilots should fly each maneuver with a well-briefed safety pilot keeping an eye out. Then identify and teach everything they are doing with their eyes, hands and feet. Yes, eyes, hands and feet! When you are at the 180 position, what are you looking at? Your point of intended landing? Do you draw an imaginary arc to the extended center line? Do you glance back in the cockpit to check airspeed or altitude? When and how often? When do you shift your eyes from the point of intended landing to the departure end? What do you do with your eyes? Your eyes are the primary sensors that transmit impulses to the brain for action by your arms and legs. What you look at and when, is important and must be learned. Teach your students well.

Consider your hands — they perform the most conscious actions, but there are still a multitude of acts performed without much thought. Do you squeeze off the power or take it off? How much is "a little power" in terms of throttle movement or power reading? What do you do with the throttle just prior to touchdown? What about the hand on the stick? How often do you put in a few units of trim without thinking about it? How much is "a little flare" or "a little stick pressure" in terms someone else might understand? It must be learned. Teach your students well.

Consider your feet. We hardly think of our feet unless they get cold or go to sleep. However, they do manipulate a flight control, and if you paid attention, you would be amazed at how much the feet do, especially those of helicopter pilots.

One other technique that's helpful to a student is breaking complex maneuvers (for example, helicopter hoisting to a small boat) down into steps.

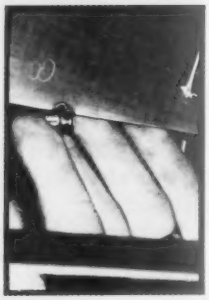
I have what I call "Scotty's Six Steps to a Perfect Hoist": brief, position, trim, transition, relax, and retreat.

Certainly there are several important aspects to each step, but the student learns he can use the steps as a mental checklist to build a good maneuver.

Legends are good. They add color and esprit de corps to our profession. But legend will never replace good instruction. We must become more than flight critics. Perhaps if we concentrate on making legends instead of becoming legends, we'll be well on our way. ◄

LCdr. Olin is the flight safety officer for USCG Air Station, Elizabeth City. He is qualified in the HC-130H and HH-3F. He has served as an instructor pilot, and as a Navy H-2 pilot, participated in the evacuation of Saigon in 1975. He transferred to the Coast Guard in 1977.

LETTERS



A LOOSE FASTENER CAN RUIN YOUR WHOLE DAY

Re: Safety Poster (Feb '86)

Monterey, Calif. — The readers who are either giggling or aghast at the offending hand in the poster missed the point. A 50-cent stress fastener like the one at the tip of the investigator's fingers had, just days before, converted $115,000 worth of carefully balanced and finely machined titanium compressor blades into so much useless junk. The "serious maintenance 'no-no'" (to use your words) was the failure of a half-dozen skilled troops to keep the work area clean and to properly account for fasteners used in the job (Letters, July 1986). The accident investigator's hand could have just as easily been framed in blackened engine parts plucked from a smoking hole. His "safety violation" would have been equally moot.

As the owner of the offending hand, I was somewhat amused by the feedback and the ability of so-called professionals to belabor the trivial at the expense of the obvious; kind of like getting a tally on an F-5 at 20 miles seconds before hitting an airliner.

I invite your attention to a 1983 Class C mishap buried somewhere in your archives to get some of the flavor of the events behind the poster. Some hard-working troops with an earnest can-do attitude committed a very fundamental error that ruined their whole day. It's a sobering thought when compared to my wedding band getting in the way.

Keep up the good work! We even get Approach magazine here in the Weapons Curriculum of the Postgraduate School. Rest assured it is a pleasant break from the laws of physics and mysteries of computers and electrical engineering.

LCdr. Cal P. Langford
Naval Postgraduate School

• We agree — external pressure, motivated personnel and a lack of supervisory guidance contributed to FOD an engine. We also agree that rings are a hazard. Both problem areas have been seen many times before and both deserve constant attention. — Ed.

Re: "On the Bolter, You've Got Engine Problems" (June '86)

Pensacola, Fla. — You have wrongly identified a catapult tension bar as a catapult holdback assembly. I have removed and discarded countless numbers of these "T-bars" over the side while running holdbacks aboard USS *Wasp* (CVS 18), so I feel I've had my fair share of those blue and yellow babies while working with the topside "cat" crew.

I hope your analysts will be able to substantiate my statement and set the rest of the naval aviation community straight.

AKC (AW) R.D. Bowers
Naval Supply Center

• Actually, the proper title is "release element," but the critter in question is commonly called a "T-bar," a "tension bar" and (you guessed it) a "holdback fitting." This word comes directly from LCdr. John H. Starnes, head of the Air Operations Branch, Naval Safety Center.

Re: Who Let Us Down (Aug '86)

NAS Whidbey Island, Wash. — In the interest of clarification, we of W/C 110, VP 69, would like to comment on a recent letter submitted by a VP squadron safety petty officer.

He stated he was tired of being the only one who found and corrected safety violations and prevented unsafe equipment from being used. He also referred to a method by which we can take our safety-related problems topside if we feel that the problems are not being resolved at our level.

As members of this squadron's safety work center of the quarter for five of the last six quarters, it has been our experience that much of the discovery and correction of unsafe practices and equipment goes on at our level with just a quiet word to the offender, a phone call to GSE or a quick note during shift passdown.

Safety is an ongoing 24-hour-a-day program encompassing much of our personal and professional lives. It is like the air we breathe; it's around us all the time.

Maybe we at this level need to take a little time out of our very busy days and communicate with the topside folks on the positive accomplishment of completing our jobs safely.

We feel that when looking at the big picture as it relates to the safety program, we *are* doing a good job and are striving to do a better job.

AD1 R. Carr
AD2 W. Crouch
AD2 P. Carmichael
AD2 J. Lisius
AD2 M. Jolly
AD2 S. Bally
AD2 A. Torstenson
AD2 V. Redman
AD2 M. Kreeger
AS2 R. Aune
AZAN J. Smat
ADAA E. Howard
W/C 110
VP 69

• Taking care of problems at the shop level can provide for maximum efficiency. The original letter termed a safety program effective if you "only hear of discrepancies in conjunction with how they have been corrected." A safety department needs to know what is going on so it can screen for the same problem in other work centers, according to LCdr. John R. Wilhelm, aircraft operations analyst at the Naval Safety Center. The enlisted safety committee is an excellent forum for exchange of this type of information.

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approach 1986 Index

Note: Due to a change in publishing schedule, there were only 11 issues of Approach in 1986.

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Bravo Zulu	WINTER	26

AV-8A

Bravo Zulu	WINTER	27

C-2

Deja Vu in a C-2 — airbreak, 700-pound overload	FEB	9

C-12

Low Oil Pressure — airbreak	SEP	13

F-14

Somebody Out There is Trying to Kill Me — rough time back to the carrier	MAR	8
Crew Concept — RIO's story on CV approach	MAR	12
They're Trying to Kill You — carrier ops, watch your fuel state	JUN	26
More Than Just a Single-Engine Landing! — frozen throttle, improper crew coordination	AUG	26
Hail Hath No Fury Like a Metro Scorned — airbreak	WINTER	6
Tomcat Night Launch Emergency — airbreak, single-engine night divert	WINTER	7
No Longer a Nugget — nighttime emergency bingo gives a RIO experience	WINTER	16

F/A-18A

Bravo Zulu — VFA 106 pilot gets aircraft back in non-NATOPS situation	APR	17
Fuelish Hornet — airbreak, launching without checking security of fuel tank cap	WINTER	7

H-2

A Close Encounter — Helo Kind — an alert LSE saves helo	MAR	26
We Lost the Umbilical — LPH ops	SEP	28
Piece of Cake — fuel transfer problems	WINTER	32

H-60

Bravo Zulu	WINTER	27

P-3

Where Am I? — talking on the wrong frequency can be a hazard	FEB	12
The Vulnerability Factor — overconfidence leads to problems	APR	12
Down the Primrose Path — aircraft nearly hits mountain at night, airbreak	MAY	18
Fire At Midnight — fire in No. 3 engine	SEP	18

S-3

Things That Go Tumbling in the Night — COTAC's story on faulty VDI incident	FEB	16
It Ain't Over Til It's Over — emergency on fuel nearby ruins flight	MAR	22
A Funny Thing Happened on the Way to the Ship — single-engine emergency flight control incident	JUN	28

Bird Strikes

Bird Strikes at the Hold Short Position — A-4s are beset by egrets	FEB	24
Bird Avoidance — reporting bird strikes helps	MAR	14

Carrier Operations

Ball, Ball, Ball — opinions on flying the ball	FEB	26
A Letter to the Captain — BM3 nearly injured	MAR	2
Centered Is Not Always Centered — F-4 Mode II incident	APR	13
A Night to Remember — F-14 landing incident	JUN	2
Flight Deck Safety Problem — anymouse, too early helo start	JUL	14
Stung By a Stinger — F-14 tailhook/stinger separation	MAR	20
Larry Lineup — the little "voice" whispers bad approach calls	WINTER	15
Carrier Deck Lighting and the Ramp Strike — revamping threshold lighting may help prevent ramp strikes	WINTER	20

Command and Supervision

A Letter to the Captain — BM3 nearly injured due to poor supervision	MAR	2
Leadership: The Linchpin of Safety — CO's thoughts	MAR	28
Advice to a Fledgling Aviator — 10 rules to live by	MAY	16

Bless Me XO, For I Have Sinned — XO's poor handling of a JO during a meeting — JUL 29
Wild Max — why did the No. 1 lieutenant die like this? — AUG 15
Attitude Flying — a pilot's attitude is a key element in his performance — WINTER 8
Whatever It Takes — a first-cruise nugget learns the meaning of the phrase — WINTER 13

Ejection/Survival

What Happened to the Good Deal? — TA-4J incident near Hawaii — JAN 16
The Day the Engine Stood Still — A-7 pilot suffers vertebrae injury — JAN 20
A Helo Crew Exposes Themselves — hypothermia protection by flight gear — FEB 4
How Prepared Are You? — SAR drills help — MAR 18
My First Ejection — EA-6B story — APR 8
Improvisation: A Survivor's Best Tool — good suggestions — JUL 18
Survival Equipment: Fleet Perspective/Rigger's Perspective — JUL 22
Emergency Decisions — making the right choice begins before the flight — AUG 20
What Is OK? — discussion of IROK procedures — AUG 23

FOD

All-Hands Walkdown — 1,600 people cover a lot of ground — JAN 28
Give Me My Hat and My Glove — airbreak, flight glove is cockpit FOD in F-4 — JUN 7
"On the Bolter, You've Got Engine Problems!" — A-7 eats a catapult holdback fitting — JUN 11

Flight Operations

Who's Watching Who Out There? — EA-6B NMAC — JAN 9
Look Ma! No Wheels! — distractions result in wheels-up landings — FEB 30
A Day in the Life of a Varmint — two instructors let overconfidence override their judgment on a cross-country — APR 16
Sign Strike — TA-4J crew gets below glide slope — MAY 10
Where Are Your Wheels? — don't turn a gear-up pass into a wheels-up landing — JUN 8
We're at 18,000 Feet, Aren't We? — A-6 crew and complancency — JUN 24
Long Range, Low Level, 1956 — reprint Low Level — SEP 2
Flight, High Level Risk — considerations on low-level flight
Out of Gas and Nowhere to Go! — check divert weather — A-6 incident — SEP 11
New Meat for the Fleet — caviats for new Naval Aviators — JUL 26
Terrain Illusions: A Plug for ROE — low level nearly becomes tragedy for A-7s — SEP 20
"We're Not Going to Make It" — increased winds make problems for flight planning — WINTER 23

Hazardous Cargo

Just What Am I Carrying? — MAR 16
Hazardous Cargo and the 505 — airbreak, discussion of 505 use — JUL 8

Helicopter

Why Do We Keep Letting Ourselves Get Sep Up? — good planning and standardization improve safety — JAN 24
Them — we change NATOPS — JAN 27
Helos Don't Fly in That Stuff! — bad weather and helo story — FEB 23
Do You Smell Something Burning? — H-3 single-engine emergency — APR 10
Mast Bumping — APR 24
The Hot Seat — hot switching at night, H-53 story — APR 30
Predict, Prepare and Prevent — preventing mishaps — MAY 11
Out on the Tip of the Sword — H-2 gropes in the fog — MAY 30
We Have Met the Enemy and He is Us! — discussion re: flying helo passengers — AUG 18

Instruments and Navigation

VDPs and Pilot Longevity — visual descent points, a discussion — APR 2
Which Flight Instruments Do You Believe? — APR 2
True and Magnetic North? — discussion — JUL 30
The CHUM — discussion of DMA's Chart Updating Manual — SEP 14

In-flight Refueling

D-704 In-Flight Refueling Problems — airbreak, F-14/A-6E incident — APR 6
Riding With Experience — S-3 incident — MAY 26
Transoceanic Ordeal — routine translant turns into a nightmare — WINTER 2

Landing Signal Officer

LSOs Save a T-2 — airbreak, alert LSO saves an SNA and T-2 — APR 7
The Care and Feeding of an LSO — a little TLC for the new LSO helps — AUG 22
"Get Him Aboard, Paddles" — airbreak, KA-6 compromises wave-off window — WINTER 7

Maintenance

Enter the Dragon — extinguishing JP-4 — FEB 25
Canopy Clamps a Mech — airbreak — MAY 19
I Don't Get No Respect — anymouse, rigger's complaint re: name tags — AUG 12
Ejection Seat Hazard — anymouse — AUG 13
Anymouse Needed: A Bigger and Better Anymouse — discussion and retrospective — MAY 12

Near Midairs (NMACs)

Lucky Corsairs — airbreak — JAN 10
A Different Kind of Midair — T-2 hits a Cessna — JUN 30

Miscellaneous

Coming Home — naval aviator uses same common sense in civilian aircraft — MAR 31
In the Beginning — various developments brought naval aviation to its plac- today — MAY 2
The Role of Flight Safety in My Flying Career — Royal Navy pilot's experiences — MAY 8
. . . And Then There Was One — story of 1919 NC-4 transatlantic flight — MAY 20
The Naval Reserve Reaches 70: Interview With RAdm. T.F. Rinard, COMNAVAIRESFOR — AUG 2

NATOPS and Safety

Is Your Squadron Safe To Deploy? — JAN 12
Grampaw Pettibone Award — VA 27 receives first award — MAR 1
Yeah, He was a Hot Pilot, But . . . — being SH means coming back safe — MAR 10
Who's Going to Do the JAG Investigation? — guidelines after the mishap — MAR 21
Just Another NATOPS Lecture — suggestion — AUG 30
Go the Extra Yard — aircraft mishap investigations — SEP 26
Who Wants to be a "Safe Pilot?" — the image of a safe pilot vs. a hot pilot — WINTER 14
Deja Vu — a list of safety survey discrepancies — WINTER 18

Technical

Some Physics of Turning, Critical at Low Level — SEP 8

Training

How Far Should A Student Get Involved? — should students ask if in doubt? — APR 1

Ultralights

Ultralights: Thrill or Threat — continuing problems with ultralights — APR 11

Search and Rescue

Bravo Zulu — special on NWC China Lake's helicopter crews — JUL 24

Weather

Hazards of Winter Operations II — various problems, hazards and considerations — JAN 2
Believe It or Not, It's Thunderstorm Season Again — APR 18
Against All Odds, Microburst Survival — JUL 2
Why I Don't Fly Through Thunderstorms Anymore — hail damage — AUG 10
The Viking and the Thunderbumper — AUG 16

Stork with help from flea presents:

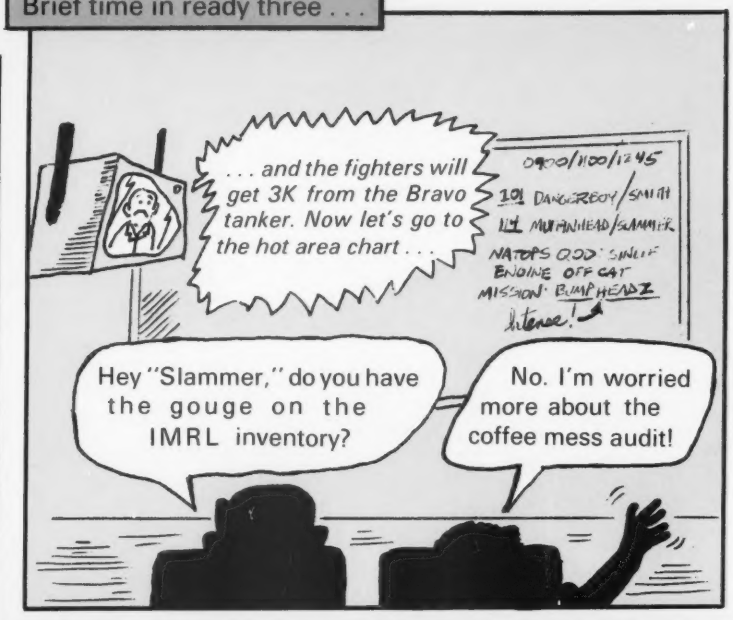
BROWNSHOES IN ACTION COMIX

"The kind real aviators like"

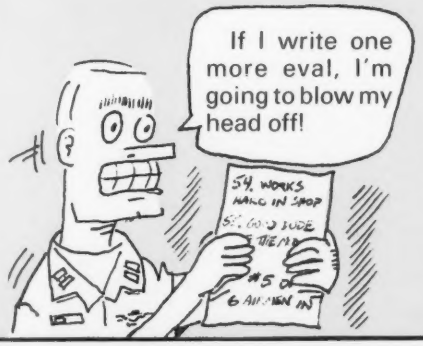
Contributed by Lt. Ward Carroll, VF 32

Sure, recent films and books have captured the mood that surrounds naval aviation, but those closely associated with that way of life know that the public received only a small glimpse of the total "action" package. Take Lt. Lance "Dangerboy" Jones, for example:

Brief time in ready three . . .


. . . and the fighters will get 3K from the Bravo tanker. Now let's go to the hot area chart . . .
0900/1100/1245
10L DANGERBOY/SMITH
NL MUTTONHEAD/SLAMMER
NATOPS QUIZ: SHELF
ENGINE OFF CAT
MISSION: BUMPHEADZ
Intense!
Hey "Slammer," do you have the gouge on the IMRL inventory?
No. I'm worried more about the coffee mess audit!

His gloved hand has squeezed off 20mm with ease and also attempted to squeeze black out of the stick at three-fourths NM at night. He's seen everything from cocked nose gear to some incredible DPs in Bit 7. He knows it all: pulling G's, breathing 100 percent oxygen, (NEPIC), bolters . . .

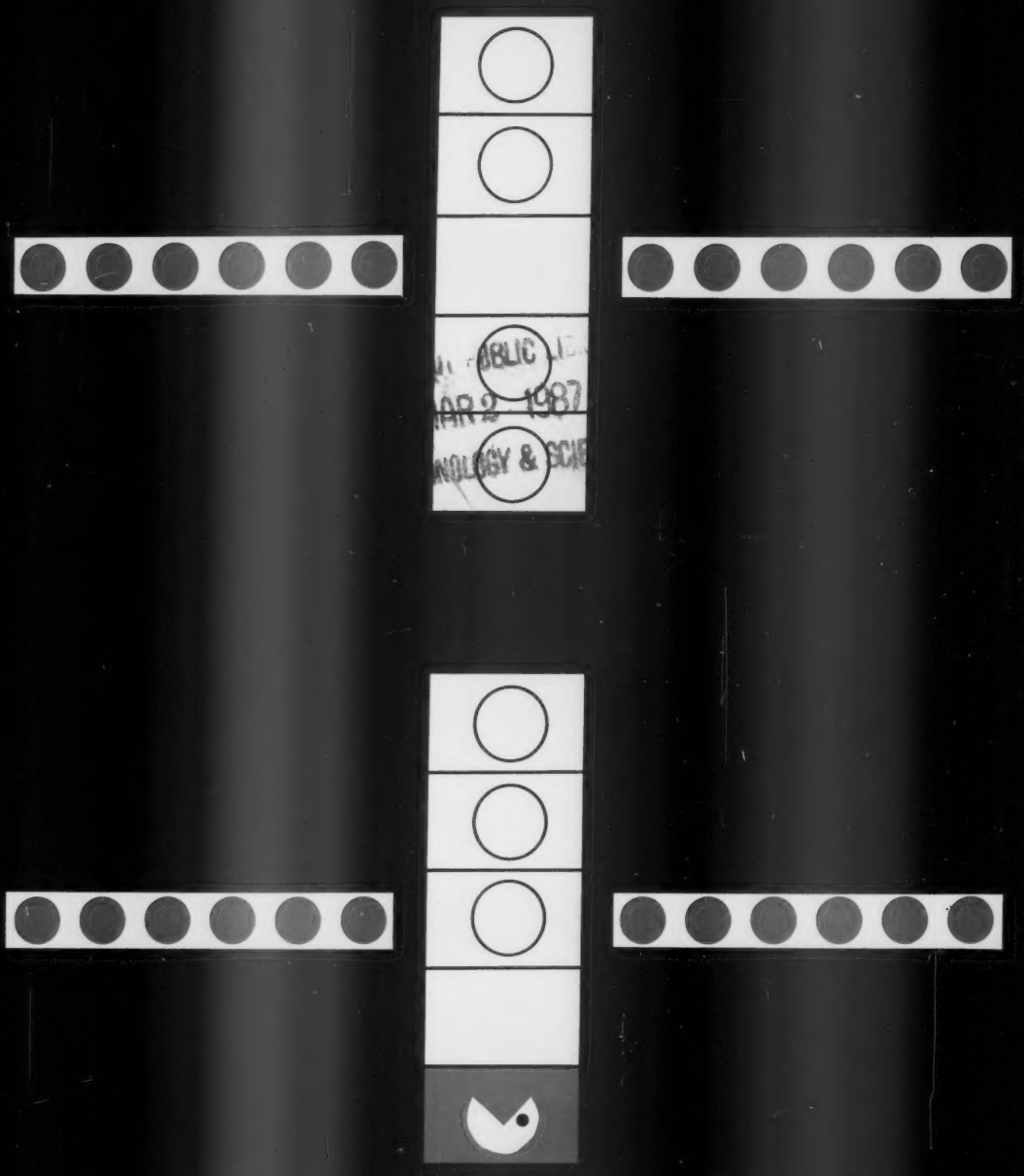


Same brief, different day. Every nuance of this business becomes second nature allowing the aviator to free up his mind and deal with other pressing issues . . .

Dangerboy walks a bit late due to a heated discussion with the AMO regarding additional TAD requirements to AIMD. No big deal, he's done this a million times . . .

What th-
I wonder what the flick is tonight.
RIGHT TURN OFF CAT 2!
Man, I can't wait for my first cat shot. I heard it's like being run over by a bus while watching "Body Heat"!
I wonder if my allotments have started?
(Self-given rag call-sign)
BOLT

COM-PART-MEN-TAL-IZE (Kem part men't'liz'), Naval Aviation. To concentrate on the task at hand!



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NOLOGY & SCIE

It's no game.

DON'T GO LOW!

Poster idea contributed by LCdr. J.W. Lawson, Safety Officer, VAQ 131.